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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/064,032

06/04/2002

Steinar Bjaerum

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03/21/2006

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EXAMINER

LAVIN, CHRISTOPHER L

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/064,032	BJAERUM ET AL.	
	Examiner	Art Unit	
	Christopher L. Lavin	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

This action is in response to the RCE filed on 12/30/05.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 – 6, and 11 – 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki (5,622,174).

In regards to claim 1, Yamazaki discloses In an ultrasound machine for generating an image responsive to moving structure within a region of interest of a subject by displaying at least one color characteristic corresponding to a movement parameter of said structure, apparatus for mapping said color characteristic comprising: a front-end arranged to transmit ultrasound waves into said structure and to generate received signals in response to ultrasound waves backscattered from said structure in said region of interest over a time period (Figure 54, items 11 and 15); a processor responsive to (i) said received signals to generate a set of parameter signals representing values of said movement parameter within said structure during said time period, (ii) a distribution of said set of parameter signals, and (iii) a mapping algorithm to generate a set of color characteristic signals representative of said values of said movement parameter (Figure 54, item 43; col. 26, line 51 – col. 27, line 44: Cardiac Velocity of a placed ROI is measured and a velocity color map is created to color the

image.); and a display arranged to display a color representation of said moving structure in response to said set of color characteristic signals (Figure 60).

In regards to claim 2, The apparatus of claim 1 wherein said moving structure comprises cardiac tissue (Figure 60).

In regards to claim 3, The apparatus of claim 1 further comprising a user interface arranged to enable an operator to select said region of interest from said image on a monitor (Figure 54, item 43; col. 26, line 51 – col. 27, line 44: The user places the ROI using the operation panel.).

In regards to claim 4, The apparatus of claim 1, wherein said movement parameter comprises one of velocity and strain rate (col. 26, lines 58 – 65).

In regards to claim 5, The apparatus of claim 1, wherein said color characteristic comprises hue (col. 26, lines 58 – 65: Hue is the gradation of color, as there are multiple colors used to display the velocity color map, this map's color characteristic comprises hue.)

In regards to claim 6, The apparatus of claim 1, wherein said time period comprises at least a portion of a cardiac cycle (col. 27, line 30).

In regards to claim 7, The apparatus of claim 1 wherein said distribution of said set of parameter signals comprises a histogram representing frequency of occurrence of said values of said movement parameter (col. 27, lines 37 – 44).

In regards to claims 11 – 17, claims 11 – 17 are rejected for the same reasons as claims 1 – 7. The argument analogous to that presented above for claims 1 – 7 is applicable to claims 11 – 17.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 8 – 10 and 18 – 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Washburn (6,017,309).

In regards to claim 8, Yamazaki discloses computing a velocity histogram as shown in the rejection of claim 7. However Yamazaki does not use this histogram to create the velocity color map. Although not stated in this embodiment it is implied that Yamazaki creates the color map in a fashion similar to Figure 7 or Figure 36.

Washburn teaches (col. 8, line 31 – col. 9, line 19) of creating an ultrasound velocity color map of blood flow using a histogram.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use a histogram (as taught by Washburn) to create the velocity color map in the apparatus disclosed by Yamazaki. Using a histogram would allow for more detail to be displayed in the image as the complete color spectrum could be used. More detail would help a physician better diagnose a patient.

In regards to claim 9, The apparatus of claim 8 wherein said mapping algorithm further comprises normalization of said cumulative total to a domain of a color characteristic legend (Washburn: col. 9, lines 3 – 19: Histogram equalization is normalization of the histogram.).

In regards to claim 10, The apparatus of claim 8 wherein at least one of said histogram and said mapping function is weighted (col. 8, lines 42 – 54: By maximizing low velocity flow Washburn is weighting the histogram and the mapping function.).

In regards to claims 18 – 20, claims 18 – 20 are rejected for the same reasons as claims 8 – 10. The argument analogous to that presented above for claims 8 – 10 is applicable to claims 18 – 20.

In regards to claim 21 and 22, claims 21 and 22 are rejected for the same reasons as claim 8. The argument analogous to that presented above for claim 8 is applicable to claim 21 and 22. Washburn discloses coloring an image dynamically. The purpose of this operation is to use as many colors as possible within the color map, thus Washburn discloses a full dynamic color mapping operation. It should be noted that the applicant does not define the phrase "full dynamic range" in the specification and therefore the words have been given their plain meanings.

### ***Conclusion***

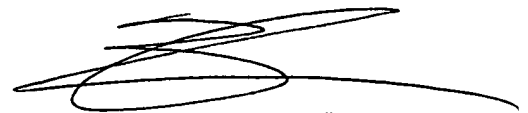
After further consideration of the art, the examiner still feels claim 1 is not claiming an adaptive color mapping step. All that is being called for is a processor responsive to a mapping algorithm. How does Yamazaki not disclose a color mapping algorithm? That algorithm takes in movement parameters and outputs color signals. The examiner would like to apologize for any confusion he may have caused the applicant during the interview on 12/02/05. The examiner would also like to point the applicant to the rejection of claim 8, which shows a 103 with an adaptive color mapping algorithm. For that reason alone, even if the applicant had successfully modified the independents to call for an adaptive color mapping algorithm the claims would not have been allowable. The examiner suggests that the applicant focus more on how the adaptive algorithm works, as this is most likely where the allowable material lies. If the applicant's representative would like to discuss ideas for amendments the examiner would be more than willing to take the time to assist the applicants.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L. Lavin whose telephone number is 571-272-7392. The examiner can normally be reached on M - F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Lavin



**BRIAN WERNER**  
**PRIMARY EXAMINER**